

REMARKS

Claims 8, 18, 19, 25, 32 and 33 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants respectfully traverse this rejection.

The recited solubility in claims 8 and 25 was stated to be indefinite absent a particular temperature used in measuring said solubility since said solubility is dependent on the temperature. The recited molecular weight in claims 18, 19, 32 and 33 was stated to be indefinite absent a particular average molecular weight since there is a big difference between a number average molecular weight and weight average molecular weight depending on the polydispersity (M_w/M_n).

In order to expedite prosecution, claims 18, 19, 32 and 33 have been cancelled. With regard to claims 8 and 25, however, Applicants wish to submit that 25 degrees C is the accepted standard for measuring water solubility and that if the reference does not state a different temperature one skilled in the art would assume that the measurement was made to 25 degrees C. Applicants have added this temperature to the specification and the claims.

Claims 1, 2, 4-10, 13-15, 19-23, 25-27, 33 and 34 have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wada et al (US 4,507,378). Applicants respectfully traverse this rejection.

The Examiner states that "Wada et al teach the instant process of making polymer-dye particles at col. 2, lines 37-44 and in example 1. Various dispersants (co-stabilizer) and surfactants are taught at col. 2, line 65 to col. 3, line 33. Various dyes such as azo oil black and initiators are taught at col. 4, lines 12-40. Said azo oil black inherently meets the recited solubility and the polymer of example 1 also inherently meets the recited molecular weight. Homopolymer (using a single monomer) is taught at col. 4, lines 8-9.

Applicants have amended their claims to provide that the composite polymer dye particles have a mean particle size of less than 100 nm and that the co-stabilizer is associated with the polymer dye particles. Support for the amendment regarding particle size can be found at page 11, line 18. Support for the amendment regarding the co-stabilizer can be found at page 11, line 28.

This invention provides composite polymer-dye particles comprising a colorant phase, containing a water insoluble dye, and a polymer phase, said particles being associated with a co-stabilizer. The final composite polymer-dye particles made by the process of the invention have better stability than those prepared by the prior art. The particles are also more stable during the manufacturing process. An ink formulated with such particles has improved ozone stability, colloid stability, and good resistance to abrasion.

In the current invention the particles are generally used in inks, more particularly ink jet inks and it is desired that the co-stabilizer stay in association with the colorant particles. In contrast, Wada is directed to a method of forming toner particles and the stated purpose of the method is to provide particles which have the dispersant removed, see col. 2, lines 8 to 25 and col. 5, lines 6 to 29.

Additionally, it is preferred that the mean particle size of the polymer dye particles of the invention be less than 100 nm. This allows for improved jettability. In contrast, the particles of Wada are much larger, as required for a toner. In the Examples of Wada the average particle diameter is in the 11 to 15 micron range.

Therefore it is submitted the current invention is both novel and non-obvious over Wada.

Claims 1-10, 13-27 and 30-34 have been rejected under 35 U.S.C., 102(3) as anticipated or by, in the alternative, under 35 U.S.C. 103(a) as obvious over Cheng (US 6,309,787). Applicants respectfully traverse this rejection.

The Examiner states that "Cheng teaches the instant miniemulsion polymerization and colorant encapsulate latex in examples. Example 1 shows Mw of 30,000 and an average particle size of 403 nm. The instant co-stabilizers such as cetyl alcohol and hexadecane (col. 5, lines 33-39) and average diameters (100-1,000 nm) of polymeric particles (col. 8, lines 7-8) are taught.....Also, dye taught at col. 15, line 39 is water insoluble since miniemulsion polymerization is dispersions of oil (monomer) in water (col. 12, line 22-65). The dye must be present with oil monomer in order to become a part of the polymeric particles."

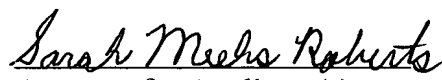
Applicants have amended the claims to provide that the polymer dye particles must have a mean particle size of less than 100 nm. In contrast the miniemulsion of Cheng has a particle size of 100 to 1000 nm, preferably 200 to

600 nm. Therefore, the current invention is novel over Cheng. Furthermore, Cheng is directed to forming large aggregate toner particles. It is very inefficient to form a miniemulsion smaller than 100 nm if one is going to then aggregate the particles to form larger particles (thus the preferred range of above 200 nm). Furthermore, Cheng appears to prefer pigments which, using this method, cannot be made into particles of less than 100 nm. Therefore, given the teaching of Cheng for making toner particles, one skilled in the art would be very unlikely to form a mini latex colorant emulsion having a particle size of less than 100 nm. Therefore the current invention is not obvious in light of Cheng.

Claims 1-34 have been rejected under 35 U.S.C. 103(a) obvious over Cheng (US 6,309,787) in view of Moore et al (US 4,698,651), Weber et al (US 5,997,622) or Evans et al (US 6,001,161). Applicants respectfully traverse this rejection. As argued above, the current invention is novel and unobvious over Cheng. The additional references are merely related to various dyes and do not add any disclosure relevant to the method of making polymer-dye particles. Therefore they do not make the current invention obvious. Furthermore, none of Moore, Evans or Weber are related to making toner compositions and therefore one skilled in the art would not combine them with Chen.

In light of the above amendments and remarks, Applicants respectfully request that the claims as amended be allowed.

Respectfully submitted,


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